

CLAIMS:

What is claimed is:

1 1. A data storage system, comprising:
2 a plurality of read/write heads;
3 a plurality of data channels, a subset of said
4 plurality of data channels coupled to a read/write head
5 of said plurality of read/write heads; and
6 a storage medium, said storage medium including a
7 plurality of storage bands, wherein each read/write head
8 of said plurality of read/write heads is aligned to read
9 or write data from or to a corresponding storage band of
10 said plurality of storage bands, and access at least said
11 subset of said plurality of data channels.

1 2. The data storage system of Claim 1, wherein said
2 data storage system comprises a magnetic tape drive.

1 3. The data storage system of Claim 1, wherein said
2 plurality of read/write heads comprises at least one
3 read/write head of a read/write configuration and a
4 write/read configuration.

1 4. The data storage system of Claim 1, wherein said
2 plurality of read/write heads comprises at least one
3 read/write head of a read/write/read configuration and a
4 write/read/write configuration.

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1 5. The data storage system of Claim 1, wherein at least
2 one read/write head of said plurality of read/write heads
3 includes a read/write element and a write/read element.

1 6. The data storage system of Claim 1, wherein a number
2 of said plurality of read/write heads is equal to a
3 number of said plurality of storage bands.

1 7. The data storage system of Claim 1, wherein a
2 relationship between said subset of data channels and
3 said plurality of read/write heads is defined as M/N ,
4 whereby M/N comprises a number of data channels per
5 read/write head.

1 8. The data storage system of Claim 1, wherein a
2 relationship between said subset of data channels, said
3 plurality of read/write heads, and said plurality of
4 storage bands is defined as M/N , whereby M comprises a
5 total number of data channels, and N comprises at least
6 one of a total number of said plurality of read/write
7 heads and a total number of said plurality of storage
8 bands.

1 9. The data storage system of Claim 1, further
2 comprising:
3 a position control unit, said position control unit
4 operable to align at least one read/write head of said
5 plurality of read/write heads with said corresponding
6 storage band of said plurality of storage bands with a
7 single positioning mode of operation.

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- 1 10. A read/write head assembly, comprising:
2 a plurality of read/write heads, each read/write
3 head of said plurality of read/write heads operable to
4 read or write data from or to a corresponding storage
5 band of a plurality of storage bands arranged on a
6 storage medium; and
7 a plurality of data channels, a subset of said
8 plurality of data channels coupled to a read/write head
9 of said plurality of read/write heads.
- 1 11. The read/write head assembly of Claim 10, wherein
2 said storage medium comprises a magnetic tape.
- 1 12. The read/write head assembly of Claim 10, wherein
2 said plurality of read/write heads comprises at least one
3 read/write head of a read/write configuration and a
4 write/read configuration.
- 1 13. The read/write head assembly of Claim 10, wherein
2 said plurality of read/write heads comprises at least one
3 read/write head of a read/write/read configuration and a
4 write/read/write configuration.
- 1 14. The read/write head assembly of Claim 10, wherein at
2 least one read/write head of said plurality of read/write
3 heads includes a read/write element and a write/read
4 element.

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1 15. The read/write head assembly of Claim 10, wherein
2 said subset of said plurality of data channels comprises
3 a read channel and a write channel.

1 16. The read/write head assembly of Claim 10, wherein a
2 number of said plurality of read/write heads is equal to
3 a number of said plurality of storage bands.

1 17. The read/write head assembly of Claim 10, wherein a
2 relationship between said subset of data channels and
3 said plurality of read/write heads is defined as M/N ,
4 whereby M/N comprises a number of data channels per
5 read/write head.

1 18. The read/write head assembly of Claim 10, wherein a
2 relationship between said subset of data channels, said
3 plurality of read/write heads, and said plurality of
4 storage bands is defined as M/N , whereby M comprises a
5 total number of data channels, and N comprises at least
6 one of a total number of said plurality of read/write
7 heads and a total number of said plurality of storage
8 bands.

1 19. The read/write head assembly of Claim 10, further
2 comprising:
3 an actuation unit, said actuation unit operable to
4 align at least one read/write head of said plurality of
5 read/write heads with said corresponding storage band of
6 said plurality of storage bands with a fine positioning
7 operation.

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1 20. A method for reading and writing data from and to a
2 storage medium, comprising the steps of:
3 arranging a plurality of storage bands on said
4 storage medium;
5 arranging a plurality of read/write heads in
6 proximity to said plurality of storage bands;
7 coupling a subset of a plurality of data channels to
8 at least one read/write head of said plurality of
9 read/write heads;
10 aligning said at least one read/write head of said
11 plurality of read/write heads with at least one of said
12 plurality of storage bands; and
13 said at least one read/write head accessing said
14 subset of said plurality of data channels and reading and
15 writing said data from and to said storage medium.